

## A HAIR ROLLER WITH A CERAMIC COATING

## CROSS-REFERENCE TO RELATED APPLICATIONS

5 [0001] This application claims priority to U.S. Provisional Patent Application Serial No. 60/440,143 filed on January 16, 2003.

## BACKGROUND OF THE INVENTION

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1. Field of the Invention

[0002] The present invention relates to hair rollers. More particularly, the present invention relates to hair 15 rollers made from a ceramic material for improved hair curling action.

2. Description of the Related Art

20 [0003] Hair rollers are known in the art. Hair rollers are usually heated for increased curling action. Hair rollers are usually made in a first part and a second part. The first part is usually a core of the hair roller. The second part is a sheath of the hair roller. The sheath 25 is disposed around the core to surround the core. The core is usually made from a thermally conductive material such as an aluminum material, copper, steel or any other suitable metal. The sheath is usually made from a thermally non-conductive material. The sheath preferably is made to easily connect to the core. The sheath may be a 30 wax or a polypropylene.

[0004] Prior art hair rollers heat up in a quick manner because of the thermally conductive properties of the aluminum or metal core material. The user can easily manipulate the heated core by gripping the heated hair 5 rollers by grasping the sheath.

[0005] The prior art hair rollers may also have a flocking. A flocking is a treatment or coating that is applied to an outer surface of the hair roller. The 10 flocking is typically one or more particles or pieces that are connected to the hair roller for improving a texture of the hair roller. The one or more particles or pieces are typically a soft material such a cloth material. The soft material is on the core and/or the sheath of the prior art 15 hair rollers. The flocking avoids any scratching or corrosion on the core or the sheath, in addition to giving the core or the sheath of the hair roller the improved texture. The flocking provides that when a user rubs a finger or an amount of hair over the outer surface of the 20 hair roller, the hair roller has a beneficial feel that is smooth, soft and substantially similar to felt.

[0006] Prior art hair rollers are usually placed in a hair roller compartment. The hair roller compartment has a 25 heater. Prior to a commencement of styling the user's hair, the hair rollers are in the heater in the hair roller compartment. The heater heats the core of each of the number of hair rollers placed in the hair roller compartment in a very fast and rapid manner. The heater 30 heats the hair rollers until such a time as the hair rollers are needed for curling the hair.  
Contemporaneously, the sheath does not heat in the same

fast and rapid manner. Instead, the sheath is maintained cool relative to the heated core. The user can grasp the hair roller by the sheath and wind the user's hair around the hair roller for curling the hair.

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[0007] However, the prior art hair rollers are limited in their operation and benefits imparted to the hair during styling. Unfortunately, the prior art hair roller having its core made from metal will also cool in a very quick 10 manner over a short time interval. This results in an uneven heating that is detrimental for hair curling. At the outset, the hair roller is heated to a maximum level only to cool to a minimum level over a relatively short time interval while the hair is wound around the particular 15 hair roller. Also, the sheath does not adequately retain heat for any extended period of time. This cooling will result in the hair roller forming curls that are unevenly heated and looser than is desired by the stylist. Moreover, these curls will not last over any extended 20 period of time due to the heat applied to the hair.

[0008] The aluminum or metal core will further create more difficulty for the stylist. The stylist will be forced to undo the curl upon such cooling. Then the 25 stylist will reheat the hair roller or replace it with a fresh hair roller and then reapply the new heated hair roller for the desired curling action. This may further cause the stylist increased amounts of professional time to create the curls and extend the amount of time to style 30 each individual's hair. Accordingly, there is a need for a hair roller that eliminates one or more of the aforementioned drawbacks and deficiencies of the prior art.

## SUMMARY OF THE INVENTION

[0009] It is an object of the present invention to  
5 provide a hair roller that retains heat and radiates heat  
evenly at a preferred wavelength for an extended period of  
time.

[0010] It is another object of the present invention  
10 to provide a hair roller that is easy to grasp and  
manipulate for styling and that has an outer surface to  
grip the hair wound around the hair roller.

[0011] It is still another object of the present  
15 invention to provide a hair roller that has an improved  
texture.

[0012] It is yet another object of the present  
invention to provide a hair roller that radiates heat for  
20 an extended period of time.

[0013] It is still yet another object of the present  
invention to provide a hair roller that has a flocking with  
a number of ceramic particles being disposed in the  
25 flocking.

[0014] It is a further object of the present invention  
to provide a hair roller that has a body having an outer  
surface with the outer surface having a ceramic carrying  
30 paint disposed thereon.

[0015] It is still a further object of the present invention to provide a hair roller that has a body with an outer surface that has ground or powdered ceramic in a paint with titanium dioxide therein.

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[0016] These and other objects and advantages of the present invention are achieved by a hair roller for hair curling of the present invention. The hair roller has a body with a diameter, a height and an outer surface for winding the hair desired to be curled therearound. The hair roller also has a flocking. The flocking is disposed on the outer surface. An adhesive is also disposed around the outer surface of the body. The adhesive preferably connects the flocking to the hair roller. The hair roller further has a ceramic. The ceramic is in the flocking and is connected to the outer surface by the adhesive. The ceramic retains heat to assist in the curling of the hair.

#### DESCRIPTION OF THE DRAWINGS

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[0017] Fig. 1 is a side view of a preferred embodiment of a first hair roller, a second hair roller, and a third hair roller according to the present invention each having different sizes;

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[0018] Fig. 2 is a side view of the hair roller of Fig. 1 with a first end cap and a second end cap;

[0019] Fig. 3 is another side view of the hair roller of Fig. 1 with a flocking;

[0020] Fig. 4 is a cross-sectional view of the hair roller of Fig. 3 along line 4-4;

[0021] Fig. 5 is another cross-sectional view of the 5 hair roller of Fig. 3 along line 5-5 with a starter strip connected to the hair roller having a number of teeth;

[0022] Fig. 6 is another side view of the hair roller having the flocking with the ceramic therein;

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[0023] Fig. 7 is another side view of an alternative embodiment of the hair roller with a ceramic carrying paint; and

15 [0024] Fig. 8 is an enlarged view of a portion of the first end cap of the hair roller of Fig. 2.

#### DETAILED DESCRIPTION OF THE INVENTION

20 [0025] Referring to Fig. 1, there is provided a hair roller of the present invention generally represented by reference numeral 10. The hair roller 10 preferably has a body 12 with a substantially cylindrical shape. The body 12 has a diameter 14, a height 16 and an outer surface 18. 25 The outer surface 18 preferably defines a path for which to wind hair therearound for curling.

[0026] As is shown in Fig. 1, the body 12 may be fabricated in any number of different sizes to create hair 30 curls of different diameters and shapes. One skilled in the art should appreciate that the hair roller 10 may have any diameter 14 known in the art suitable for styling hair.

The body 12 is shown as made from a resilient material such as a thermoplastic, or any other suitable resilient material that is known in the art, or a metal material such as aluminum, steel, copper, any thermally conductive  
5 material.

[0027] Preferably, one or more such hair rollers 10 shown in Fig. 1 are all initially disposed in a suitable hair roller compartment or hair roller appliance casing 10 (not shown). The hair roller compartment has a heater connected to a power supply and a lid. The hair roller 10 is placed in the hair roller compartment and is heated by the heater in the hair roller compartment. Preferably, the hair roller 10 is heated any suitable temperature typically 15 used in ordinary hair rollers. Thereafter, the stylist opens the lid and removes the heated hair roller 10 from the hair roller compartment. Alternatively, a conventional hair dryer may also heat the hair roller 10.

20 [0028] For curling, the stylist will wind a user's hair around the outer surface 18 of the hair roller 10 and secure the hair in a wound position around the outer surface by using a suitable fastener. Preferably, the hair is secured on the hair roller 10 simply by rolling the hair 25 into the hair roller. Optionally, a spring clip may be also clamped around the hair bound hair roller 10. One problem with prior art hair rollers made from a thermally conductive metal is that the hair roller heats in a rapid and swift manner but also cools relatively quickly. This 30 allows the prior art hair roller to radiate heat in a very uneven manner at a number of different wavelengths during a period of time that the hair is wound around the hair

roller. The hair roller 10 of the present invention preferably remedies this longstanding problem and generally improves styling of the hair by evenly heating the hair for an extended period of time at a constant wavelength.

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[0029] Referring to Fig. 2, the hair roller 10 has a first end cap 20 and a second end cap 22. The first end cap 20 and the second end cap 22 preferably are each made from a suitable non-thermally conductive material. The 10 first end cap 20 and the second end cap 22 preferably allow a user to easily lift the hair roller 10 from the hair roller compartment without any touching of the heated outer surface 18 or any other heated portions of the hair roller 10.

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[0030] Referring to Fig. 3, the outer surface 18 of the hair roller 10 has a flocking 24 connected thereto. The flocking 24 is preferably disposed substantially entirely around the outer surface 18. The flocking 24 is 20 preferably a coating or a layer of a substance around a circumference of the outer surface 18. The flocking 24 of the present invention improves one or more styling characteristics of the hair roller 10. In one embodiment, the flocking 24 is connected to the outer surface 18 by an 25 adhesive layer 32 that is between the flocking 24 and the outer surface.

[0031] Preferably, the adhesive layer 32 is disposed entirely around the outer surface 18 of the hair roller 10 30 and has a thickness. Also, the flocking 24 is disposed over the adhesive layer 32 and has a ceramic 15 disposed therein.

[0032] The flocking 24 has a soft material therein. Preferably, the flocking 24 has one or more nylon fibers 26. The one or more nylon fibers 26 are disposed in spaced 5 relation from each other and in a pattern on the outer surface 18. Preferably, the one or more nylon fibers 26 are adhered by adhesive to the outer surface 18, however one skilled in the art should appreciate that any method of connecting the nylon fibers 26 is in the scope of the 10 present invention such as connection by molding or by mechanical fasteners.

[0033] The one or more nylon fibers 26 in the flocking 24 are each preferably connected to the outer surface 18 so 15 that each nylon fiber is oriented substantially perpendicular to the outer surface as shown in Fig. 3. In this manner, each nylon fiber 26 in the flocking 24 contacts the user's skin and/or hair and can yield to any pressure applied to the nylon fiber 26. In this manner, 20 the flocking 24 provides for improved soft texture when touched by the stylist or applied to the user's hair. However, one skilled in the art should appreciate that the flocking 24 may be any fabric, soft material or particles known in the art to improve the texture of the outer 25 surface 18.

[0034] In one aspect, the flocking 24 preferably protects the body 12 of the hair roller 10 by preventing any scratching or corrosion thereof by scissors, comb or 30 any other objects. The flocking 24 has one or more materials that allows the hair roller 10 to radiate heat to the hair for an extended period of time at a constant

wavelength. Still further, the one or more materials disposed in the flocking 24 increase a coefficient of friction of the flocking. This permits the hair wound around the hair roller 10 to be retained more easily on the 5 outer surface 18 of the hair roller 10 by the flocking 24. Further, the flocking 24 prevents any hair from slipping off of the hair roller 10.

[0035] Referring to Fig. 4, the hair roller 10 preferably has the suitable ceramic 15 disposed on the flocking 24 of the hair roller, in the hair roller or coated to the hair roller. The ceramic 15 retains the heat for the extended period of time. The ceramic 15 evenly radiates the heat for an extended period of time at the 15 preferred wavelength when the user's hair is wound around the outer surface 18 of the hair roller. The ceramic 15 provides for increased styling and curling of the hair wound around the hair. Preferably, the ceramic 15 on or in the flocking 24 is a number of ceramic particles, a ground 20 ceramic, or a ceramic carrying paint. Less preferably, the ceramic 15 is any of a variety of hard, brittle and corrosion-resistant materials made by shaping and then firing. Such materials include a nonmetallic mineral, for example clay, at a high temperature that are then finely 25 ground or pulverized.

[0036] The ceramic 15 preferably absorbs thermal energy that is emitted from hair styling devices such as a hair dryer or a heater as shown for illustration purposes 30 only by arrow 28. In one instance, the hair roller 10 can be heated from the heater in the hair roller compartment as shown by arrow 28. Thereafter, the ceramic 15 in or on the

hair roller 10 radiates this heat. Preferably, the hair roller 10 radiates this heat to the hair curled on the hair roller for tighter curling action at the preferred wavelength as illustrated by arrow 30 in Fig. 4. One skilled in the art should appreciate that although being shown as arrows 28 and 30 for illustration purposes the heat will radiate in all directions from the ceramic 15 in or on the outer surface 18 of the hair roller 10.

[0037] In one embodiment of the present invention, the ceramic 15 is in a powdered form. The ceramic 15 is then directly connected to the outer surface 18 of the hair roller 10. Referring to Fig. 5, the outer surface 18 has the adhesive layer 32 applied thereon. In this embodiment, the hair roller 10 may have a starter strip generally represented by reference numeral 34. The starter strip 34 is connected to the outer surface 18 of the body 12. The starter strip 34 preferably has a number of teeth 36. The teeth 36 assist with the curling action and preferably also comb the hair wound along the outer surface 18 of the hair roller 10. In one embodiment, the ceramic 15 forms a coating on the starter strip 34. In another embodiment, the ceramic 15 may be in a ground form. The ceramic 15 is then disposed in the flocking 24 and connected to the starter strip 34 or the teeth 36 by the adhesive layer 32.

[0038] Referring to Fig. 6, alternatively the adhesive layer 32 may be mixed with the ceramic 15 in a first step. Thereafter, the ceramic 15 may be connected to the outer surface 18 when the adhesive layer 32 is applied to the hair roller 10. One skilled in the art should appreciate

that the ceramic 15 should be mixed to achieve a uniform consistency prior to being applied to the hair roller 10. This ceramic 15 and adhesive layer 32 may further connect nylon fibers to the hair roller 10 in the pattern. One  
5 skilled in the art should appreciate that the ceramic 15 may be connected by other methods known in the art.

[0039] The ceramic 15 is preferably rough textured and increases a coefficient of friction of the flocking 24 on the outer surface 18. Preferably, this flocking 24 makes  
10 the outer surface 18 rougher relative to an instance of the prior art metallic hair roller. Accordingly, hair wound around the hair roller 10 will be gripped and remain wound around the outer surface 18. Once wound, the hair will not slip or traverse off of the outer surface 18 with the  
15 flocking 24 having the ceramic 15.

[0040] The ceramic 15 in the flocking 24 increases thermal conductivity of the flocking on the outer surface 18. The ceramic 15 relatively increases an amount of heat radiated off the outer surface at the preferred wavelength  
20 relative to the prior art metallic hair roller without the ceramic.

[0041] In another alternative preferred embodiment of the present invention, the body 12 of the hair roller 10 may be formed from a solid ceramic material. In this  
25 embodiment of the present invention, the body 12 is solid ceramic and may be optionally formed with the flocking 24 disposed on the outer surface 18.

[0042] In another alternative embodiment of the  
30 present invention, the hair roller 10 is made from a

resilient base material, such as a metal, or a plastic. The hair roller 10 is then coated with a ceramic carrying paint 38 as shown in Fig. 7. In this embodiment of the present invention, the ceramic carrying paint 38 is 5 selected for optimal heat absorption and conductivity. The ceramic carrying paint 38 may also be selected for other parameters such as cost and durability.

[0043] In this ceramic carrying paint 38 embodiment of 10 the hair roller 10, a number of ceramic particles, a ceramic powder, a ground ceramic, a pulverized ceramic, a number of finely dispersed solid ceramic particles, or any combinations thereof are preferably combined with a suitable paint to form the ceramic carrying paint. These 15 relatively smaller particles of ceramic material allow for a relatively higher concentration of ceramic material to be contained in the ceramic carrying paint 38 as compared to if larger ceramic particles are used. Preferably, a smaller particle size of the ceramic in the ceramic carrying paint 38 further minimizes granularity or a 20 surface roughness of the outer surface 18 of the hair roller 10.

[0044] This minimal surface roughness is preferred and 25 results in a smooth textured outer surface 18 of the body 12 of the hair roller 10. This minimal surface roughness assists in hair styling, hair curling and the texture of the hair while also gripping the hair wound on the outer surface 18. Preferably, an amount of the ceramic in the 30 ceramic carrying paint 38 is suitable to absorb heat from, for example, the heater, or the hair dryer. The ceramic carrying paint 32 radiates this heat evenly for the

extended period of time relative to the instance of the prior art metal hair rollers.

[0045] In this preferred embodiment of the present invention, the ceramic carrying paint 38 has powdered or ground ceramic particles with a titanium dioxide. Preferably, an amount of ceramic material is added in a percentage of the total weight of the ceramic carrying paint 38. Preferably, the percentage range is about one percent to about fifty percent of the total weight of the ceramic carrying paint 38.

[0046] The ceramic carrying paint 38 is preferably made with conventional enamel paint. Alternatively, the ceramic carrying paint 38 may also have a rubberized texture to assist with the curling of the hair in a comfortable manner. Less preferably, the ceramic carrying paint 38 is made with an acrylic paint, a polyurethane paint, amino resin paint, or any other paint known in the art.

[0047] Referring to Fig. 8, the hair roller 10 has the first end cap 20 that is preferably an outermost portion of the body 12 of the hair roller 10 and has an enlarged diameter relative to the diameter 14 of the body. The first end cap 20 preferably mates with a flange 40 that is integrally formed with the body 12. The flange 40 facilitates rapid assembly of the hair roller 10 during manufacture. Also, the user may grip the heated hair roller 10 at first end cap 20, and thus, prevent touching the heated ceramic 15 that is in the flocking 24.

[0048] It should be understood that the foregoing description is only illustrative of the present invention. Various alternatives and modifications can be devised by those skilled in the art without departing from the 5 invention. Accordingly, the present invention is intended to embrace all such alternatives, modifications and variances.